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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,738	03/30/2005	Yasuyuki Mizuno	511.44961X00	1963
20457	7590	12/10/2007		
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			EXAMINER SELLERS, ROBERT E	
			ART UNIT	PAPER NUMBER
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			12/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/529,738	Applicant(s) MIZUNO ET AL.	
	Examiner Robert Sellers	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-84 is/are pending in the application.
- 4a) Of the above claim(s) 1-9, 11-49 and 56-84 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10 and 50-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claims 1-9, 11-16, 18-30, 32-43, 45-49, 56-59, 66-69, 76-79 and 81-84 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected inventions, there being no allowable generic or linking claim. Claims 17, 31, 44, 60-65, 70-75 and 80 are withdrawn as directed to non-elected species of phenol-modified (claims 17 and 60-65) or epoxy/phenol-modified (claims 31 and 70-75) cyanate ester oligomer with a polyphenylene ether, or epoxy/phenol-modified cyanate ester oligomer reacted in the presence of a polyphenylene ether (claims 44 and 80). The elections were made **without** traverse in the reply filed on November 30, 2007.

1. No distinction is seen between the phenol-modified cyanate ester oligomer of independent claim 17 and the epoxy/phenol-modified cyanate ester oligomer of independent claim 31 since the formation of both oligomers involve the reaction of a polycyanate ester and/or prepolymer, epoxy resin and monovalent phenol without any reaction sequence. More favorable consideration would be given to the replacement of the word "and" in claim 17, line 4, with the phrase "then mixing" to distinguish the pre-reaction of the polycyanate ester and monovalent phenol of claim 17 (specification on page 20, lines 34-36 and page 22, line 30 to page 23, line 8, wherein (A) is the polycyanate ester, (B) is the epoxy resin and (C) is the monovalent phenol according to page 10, lines 4-9) from the reaction of all three components of claim 31 (page 24, lines 33-35).

2. The terms "may be" in line 9 of claims 51, 61 and 71 as well as "may by [sic]" in line 7 of claims 53, 63 and 73 and do not concisely denote whether R_2 and R_3 in Formula (I) and s, t and u in Formula (VII), respectively, are limited to the defined substituents and values, or include others. More favorable consideration would be given to the replacement of "may be" with "are" and "may by" with "is."

3. The claims of copending application no. 11/264,052 require a phenol-modified polycyanate ester mixed with an epoxy resin such as a biphenyl aralkyl epoxy resin without the claimed polyphenylene ether resin.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10 and 50-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno et al. Patent No. 7,157,506 in view of Japanese Patent No. 2002-309085 (Japanese '085).

4. Mizuno et al. in column 31, Example 12 shows the dissolution of polyphenylene ether resin in toluene followed by the addition of the elected species of 2,2-bis(4-cyanatophenyl)propane dicyanate ester and a calculated amount of 2.3 parts by weight per 100 parts by weight of the dicyanate ester (phr) of the elected species of p-(α -cumyl)phenol. The composition (col. 15, lines 38-40) includes a flame retardant such as the species defined in claim 53 (col. 15, line 57 to col. 16, line 55), an antioxidant and an epoxy resin such as a biphenyl type epoxy resin.

5. The claimed biphenyl epoxy resin is disclosed but not exemplified. Japanese '085 (translation, page 3, paragraph 7) discloses from 20-50 phr of a biphenyl aralkyl epoxy resin within Formula (IV) of claim 52 to provide a balance between the water resistance and solder thermal resistance at 260°C. It would have been obvious to employ the biphenyl aralkyl epoxy resin within the proportions of Japanese '085 as the disclosed biphenyl type epoxy resin of Mizuno et al. in order to provide a balance between the water resistance and solder thermal resistance at 260°C.

Claims 10 and 50-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takai et al. Publication No. 2005/0121229 and Sugio et al. Patent No. 4,496,695 in view of Davis et al. Patent No. 7,022,777 and Japanese '085.

6. Takai et al. (pages 9-10, paragraph 159, Insulating Resin Composition 2) shows a blend of polyphenylene ether resin, 2,2-bis(4-cyanatophenyl)propane and 2,2-bis(4-glycidylphenyl)propane epoxy resin dissolved in toluene. The epoxy resin can be biphenol diglycidyl ether (page 4, paragraph 60, lines 11-12). A fire retardant (page 5, paragraph 69) and antioxidant (page 5, paragraph 70) can be incorporated. (Takai having an effective filing date of March 5, 2003 can be antedated by Japanese priority application nos. 2002-286878 and 2002-287071 filed September 30, 2002 if certified English translations thereof are submitted and the subject matter therein supports that of the instant claims.)

7. Sugio et al. (col. 2, lines 47-62) sets forth a curable composition containing (a) a polyphenylene ether resin, (b)(1) a polyfunctional cyanate ester monomer such as preferably 2,2-bis(4-cyanatophenyl)propane (col. 8, lines 8-9 and 33-35) and (c) an epoxy compound such as preferably glycidyl ether type epoxy resins.

8. The claimed biphenyl epoxy resin and monovalent phenol compound are not recited. Japanese '085 is discussed in paragraph 5 hereinabove.

9. Davis et al. reports a curable composition prepared from a polyphenylene ether (col. 3, line 52 to col. 4, line 15), a thermosetting resin including mixtures of epoxy resins and cyanate ester resins (col. 2, lines 58-66), fire retardants such as 1,2-dibromo-4-(1,2-dibromoethyl)cyclohexane, hexabromocyclododecane or tris(2,4,6-tribromophenoxy-1,3,5-triazine) (col. 11, lines 13-14 and 17-18) and antioxidants such as alkylated monophenols (col. 10, lines 49 and 54).

10. It would have been obvious to employ the biphenyl aralkyl epoxy resin within the proportions of Japanese '085 as the disclosed biphenol diglycidyl ether of Takai et al. or the glycidyl ether type epoxy resin of Sugio et al. in order to provide a balance between the water resistance and solder thermal resistance at 260°C.

11. It would have been obvious to incorporate the alkylated monophenol of Davis et al. into the compositions of Takai et al. and Sugio et al. in an amount within the parameters of claim 50 in order to impart antioxidant properties thereto. The alkylated phenol falls within the ambit of both the monovalent phenol of claim 10 and the antioxidant of claim 54.

Claims 10 and 50-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent No. 2000-336188 (Japanese '188) and Sase et al. Patent No. 6,156,831 in view of Japanese '085.

12. Japanese '188 (abstracts and translation, page 1, paragraph 6) is directed to composition obtained from 100 parts by weight of a cyanate resin such as 2,2-bis(4-cyanatophenyl)propane (page 8, paragraph 37 Example), from 4 to 30 parts by weight of a monovalent phenol (page 4, paragraph 18, lines 11-12) such as p-(α -cumyl)phenol (page 8 Example), a flame retardant including the species of claim 53 (pages 5-6, paragraph 25) and an aromatic hydrocarbon solvent (page 6, paragraph 29):

13. Sase et al. (col. 3, lines 58-65) is directed to a curable composition produced from a cyanate ester compound such as preferably 2,2-bis(4-cyanatophenyl)propane (col. 8, lines 4-8), from 4 to 30 phr of a monovalent phenol such as p-(α -cumyl)phenol (col. 8, lines 18-19), a polyphenylene ether resin and solvents (col. 11, lines 21-38).

14. The claimed biphenyl epoxy resin is not recited. Japanese '085 is discussed in paragraph 5 hereinabove. It would have been obvious to employ the biphenyl aralkyl epoxy resin within the proportions of Japanese '085 in the compositions of Japanese '188 and Sase et al. in order to provide a balance between the water resistance and solder thermal resistance at 260°C.

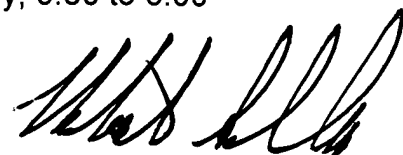
Claims 10 and 50-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent No. 2001-240723 (Japanese '723) in view of Sase et al. and Japanese '085.

15. Japanese '723 (abstracts and translation, page 2, paragraph 11) espouses a formulation derived from a polycyanate compound such as 2,2-bis(4-cyanatophenyl)propane (page 5, paragraph 12, line 4), 2.0 phr of p-tert-butyl phenol (page 13, Table 1, Example 3), from 50 to 300 phr (page 8, paragraph 24) of an epoxy resin comprising a dicyclopentadiene-phenol polyglycidyl ether and another epoxy resin such as a biphenyl epoxy resin (page 7, paragraph 23, line 4), an antioxidant (pages 8-9, paragraph 14) and a solvent (page 9, paragraph 33).

16. The claimed polyphenylene ether resin is not recited. Japanese '723 is open to other additives according to page 9, paragraph 31. Sase et al. is explained in previous paragraph 13. It would have been obvious to add the polyphenylene ether of Sase et al. as an additive to the composition of Japanese '723 in order to improve the dielectric property (Sase et al., col. 7, lines 19-22).

17. The claimed blend of the dicyclopentadiene-phenol polyglycidyl ether and biphenyl epoxy resin is not recited. Japanese '085 is described in paragraph 5 hereinabove. It would have been obvious to employ the biphenyl aralkyl epoxy resin within the proportions of Japanese '085 as the other epoxy resin in the composition of Japanese '723 in order to provide a balance between the water resistance and solder thermal resistance at 260°C.

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